

\*Centre Médico-Chirurgical Parly2

21 rue Moxouris

78150 Le Chesnay

France

E-mail: [mhabiscardio@free.fr](mailto:mhabiscardio@free.fr)

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Please note: The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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## REPLY: Comparison of Echocardiography and CT for the Assessment of Aortic Stenosis Valve Area



We appreciate the interest of Dr. Habis and colleagues in our study (1) and their contribution to this research area.

In response to their first issue, there is indeed a difference in the elliptic shape of the left ventricular outflow tract (LVOT) between systole and diastole by multidetector computed tomography (MDCT). Although this shape change is statistically significant, the clinical significance of the difference is modest and would rarely change the grading of aortic stenosis (AS) severity by MDCT. Indeed, in our study the timing of LVOT planimetry between systole and diastole would affect LVOT area by 6% (between 2% and 14%), a finding consistent with the literature (1-3) and close to the variation observed by intraobserver and interobserver variability (2). Thus, the issue of systolic versus diastolic LVOT measurement does not affect our results notably, as reported in our paper (1).

Planimetry of aortic valve area, as emphasized by Dr. Habis and colleagues, measures the geometric orifice area (GOA), not the effective orifice area (EOA), so differences between methods are expected. We agree that the theoretical interest of planimetric GOA by MDCT is linked to the hypothesis that MDCT-planimetric GOA may have superior reproducibility and reliability. Although the seminal work on CT

planimetry was encouraging from this point of view, clinical practice studies such as ours are less optimistic about the method. We indeed found a significant correlation between all continuity EOA and planimetric GOA ( $r = 0.57$ ,  $p < 0.0001$ ) (1); however, the variability remained too high to be clinically useful. Furthermore, variability between GOA and EOA changes according to AS severity, with "GOA almost equal to EOA in mild AS but significantly greater in severe AS" (4). We therefore believe that the main indication of MDCT in regard to AS severity assessment is in patients with poor acoustic windows, for planimetry of LVOT and calculation of continuity EOA. This approach is valid as long as the cutoff values used to assess severe AS account for the MDCT method's specific higher thresholds (1). Importantly, we do agree with Habis and colleagues that noncontrast MDCT has a major role in assessing the severity of calcified AS, by measuring aortic valve calcium load, independently of Doppler data and defining excess risk of mortality (5). Thus, we share the confidence of Habis and colleagues that MDCT is promised an essential role in evaluating patients with AS.

Marie-Annick Clavel, DVM, PhD\*  
Joseph Malouf, MD  
David Messika-Zeitoun, MD, PhD  
Phillip A. Araoz, MD  
Hector I. Michelena, MD  
Maurice Enriquez-Sarano, MD

\*Division of Cardiovascular Diseases and Internal Medicine  
Mayo Clinic

200 First Street Southwest  
Rochester, Minnesota 55905

E-mail: [clavel.marieannick@mayo.edu](mailto:clavel.marieannick@mayo.edu)

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